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Understanding the New Economy: A Systemic View

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Abstract

Under the rubric of the *new economy*, a wide variety of economic and social phenomena have been identified and discussed. Some of the phenomena, such as the increasing returns economics and the network externality effect, are emphasized as signaling fundamental changes in the *old* principles of the economy. The discussions on the new economy phenomena, however, do not add up. Most of the observations in the literature on the new economy are fragmented, casual, and anecdotal, not compiling to a whole picture of what the new economy is really about.

This article is an attempt at a better, more systematic understanding of the new economy. It documents what are happening presently in the economy and discusses how to make sense of it all. For this, the article adopts *system perspective* as an overarching frame of reference for analysis. The new economy is framed as a system phenomenon, exhibiting particular systemic characteristics and behavior. The various phenomena observed in the new economy are interpreted with and integrated in the system analytic framework.

The systemic characteristics and behavior of the new economy is sought in five generic aspects of a system; i) what are the entities that comprise the system, and how are they related to one another?; ii) how does the system function?; iii) what are the goods and services (output) that are generated and flow in the system?; iv) what is the value of those goods and services?; and v) what are the collective, systemic quality and attributes of the system?

To analyze the five system generic aspects of the new economy, an extensive review of the literature on the new economy is conducted. Some 30 plus so called new economy phenomena are assembled and each of them is reviewed and categorized as pertaining to and describing a particular system aspect of the new economy. Based upon the review and categorization, some essential characterizations are made for the five system aspects of the new economy. Such characterizations are interpreted as collectively enunciating the systemic characteristics and behavior of the new economy. At the end, the implications of the systemic understanding of the new economy for business and firm strategy are discussed. Some future research is suggested.

Introduction

A new economy is unfolding before us. The economy appears to operate with different principles and exhibit different behavior than what we have known before. The discussions of the new economy, however, do not add up. Most of the observations made in the literature on the new economy are fragmented, casual, or anecdotal. As a consequence, they fail to construct and convey a whole, coherent picture of what the new economy is really about.

This article is an attempt at a better, more systematic understanding of the new economy. It documents what are happening presently in the economy and discusses how to make sense of it all. For this, the article adopts *system perspective* as an overarching frame of reference for analysis. The new economy is framed as a system phenomenon, exhibiting particular systemic characteristics and behavior. The various phenomena observed are interpreted with and integrated in the system analytic framework.

In the next section, I document what are happening in the new economy. An extensive review of the new economy literature is conducted, and some 30 plus so called new economy phenomena are assembled to be characteristic of the new economy. Next I present a frame of reference, the system perspective, and use the frame of reference to identify five generic aspects of a system for organizing the phenomena together. Its purpose is to put order and structure onto the diverse phenomena, so that a coherent understanding of the new economy is possible. I draw some essential characteristics for each aspect and develop a systemic characterizations of the new economy. I conclude in the final section with the implications of the systemic understanding for business and firm strategy and some suggestions for future research.

What's happening? -The New Economy Phenomena-

Talks abound about what's happening around us and why. Dozens of new books on the new economy come out every week, if not every day, and some of them register quickly on the best sellers list and stay as such. I have reviewed a number of those books and numerous academic and trade articles to assemble a list of phenomena that are happening.¹ Some of them represent specific developments, while others describe more general trends. However, they all describe a slice of reality we call the new economy. A slice it may be though, for they are mostly anecdotal and fragmented, not compiling to a whole picture of the reality.

Below in <Table 1> is a list of some 30 plus phenomena frequently noted by the authors of the books and articles reviewed, with a brief description of each. The phenomena address various aspects of the economy, such as the mode of functioning of the economic system, the nature of the things exchanged – offerings – in the system, structural configuration of the system, the sources of value in the system, or the overall quality of the system, among others. The list is not intended to be exhaustive, nor mutually exclusive. I will go over briefly some select phenomena which carry greater implications for business today.

<Table-1> What's happening: An enumeration

Phenomenon	Description
Global networking	A weaving together of our lives, minds, and artifacts into a global scale network

¹ The list is assembled largely from books and such semi-academic sources as Harvard Business Review, Sloan Management Review, California Management Review, and McKinsey Quarterly, among others. Many of the ideas presented in them do overlap. Hence I elected to quote the sources individually, only if the idea is quite specific to the authors.

Partnering	Nobody go at it alone. Team up with others.
At the speed of thought	Everything digitized. Thoughts and actions occur almost simultaneously. Speed counts most.
Frictionless interaction and coordination	Interaction is almost free so that it is no longer a constraint to business.
Sudden impacts	Changes come so sudden, you could hardly notice it until it is all over you. Think of a Lily pond metaphor.
Winner takes all: the lottery economy	You either win or lose. No draws. It's a cutthroat game after all.
No doors closed	Openness is what counts. Avoid proprietary systems.
The ubiquitous computing	Computing is everywhere.
Positive feedback and Increasing returns	The tendency for that which is ahead to get further ahead, for that which loses advantage to lose further advantage.
Get Shorty/Immediacy	Shortened lifecycles.
Bundling of offerings	Bundle enough value into an offering so that customers cannot run away from it.
The experience economy	Own and design their experience, not their products. Be responsible for the total experience of customers, not a fragment of it.
Smart everything	There are chips in every product, making it smart.
Knowledge everything	Every product has a knowledge element in it, which itself can be made a product
Free everything	The initial design is costly. The next copy comes almost free.
Mass customizing and Prosumption	Offerings should be tailored one on one for each consumer. A consumer designs her own product.
Unbundling of activities	Disintegration, individualization of Activities in organization.
New economics of Information	The traditional trade-off relationship between the richness and reach of information no longer holds.
Markets are everywhere	Business transactions, internal as well as external, will be conducted through markets rather than hierarchies
E-lance economy	Molecularization of activities. A company of one.
Clustering and Blocking	Businesses are conducted in clusters - a geographic concentration of interrelated businesses in a particular field
Your destiny is mine. Feed the web first	A firm's destiny depends as much on the performance of the ecosystem it belongs to as on its own performance. Hence feed the system (web) first.
Digital community	A new grouping of mankind is emerging, formed on the web, sharing hobbies, interests, ideas, and feelings.
Lock-in of customers	What results as a consequence of positive feedback and increasing returns.
Disintermediation	Middlemen need to move up the value chain or they'll disappear.
Virtuality	Virtuality will become the prime mode of our existence.
No harmony. All flux	Change is a fact of life, evolution the name of the game. Nothing stays the same for long. You are unable to predict the future and unwise to hold onto the present.
Co-evolution	Evolutionary changes in one agent will affect the evolution of others.
Red queen effect	"It takes all the running you can do to keep in the same place." (from Through the Looking Glass)
The power of connectivity	There's MetCalfe's law that the addition of nodes to a network comes arithmetically, but the power of the network increases exponentially.
The connected smartness	When dumb parts are connected, they yield smart behavior.
Chaos and complexity	The new economy is a complex adaptive system.
The living systems Dynamics	The new economy is an animated swarm, exhibiting peculiar behaviors of a living system.
The surge of knowledge Business	Knowledge is the main source from which we generate value.
Infomediaries	Capturing customer information and serving customers with the information is a critical value generator.
The flow economy	You let it flow. Value comes from flowing, not from stocking.
Value at linking	Value is generated at linking as well as at manufacturing.

The first and foremost phenomenon in the new economy is that of *global networking*. What it refers to is that our lives, minds, and artifacts are now weaved into a dense, global

scale network. Behind such networking is the information technology (IT). And such IT-based networking is a prime enabler, at least physically, of most of the phenomena we observe today.

A wide variety of economic and social activities are now conducted within and upon this global network. Table 1 illustrates several descriptors that describe the modes in which the activities are conducted; *Partnering* in the table refers to the fact that in today's business, no one may go at it alone but only as a team. *Clustering* means such team efforts are often local, geography-based, as we have seen in Hollywood and Silicon Valley. (cf. Porter, 1998). Also the activities are now conducted *at the speed of thought*, i.e., we expect a minimal delay between an imagination and its realization. (cf. Gates, 1999).

Frictionless Interaction and Coordination is another important phenomenon to watch. What it means is that there is a drastic reduction in interaction cost - the money and time that are expended whenever people and companies exchange goods, service, and/or ideas - so that interaction cost is no longer a constraint in the design of business activities (Butler, et al. 1997). Interaction cost has always been a major constraint in the design of business: all else being equal, a company may organize in whatever way minimizes the overall interaction costs. Thus if the interaction costs of performing an activity internally are lower than the costs of performing it externally, the company will likely incorporate the activity within. If not, the company will contract it out to an outside party. In this sense, interaction cost used to represents friction in the economy.

As interaction cost is reduced and business becomes frictionless, the traditional firms are now being rapidly *unbundled*. (cf. Hagel and Singer, 1999). The activities that used to comprise a company need no longer be housed within or performed by a single company, but may be contracted out to outside firms. The consequence is companies more focused, specialized, modular, and flexible. Furthermore, as it involves a corresponding reduction in transaction cost, it tips the mode of governance from that of hierarchy to that of market. Hence we have the *Markets Are Everywhere* phenomenon in the table.²

e-Lance Economy is what happens when the tip toward the market mechanism is pushed to its limit. (cf. Malone and Laubacher, 1998). In the e-Lance Economy, everyone works as a freelance - a company of one, for with such a frictionless market for knowledge and skills, there is no need for firms to be in a hierarchy form. Thus, should you need anyone with any skill, just call out to the market.

How will the unbundling of the corporations proceed? Hagel suggests three trajectories - customer relationship business, product innovation business, or infrastructure business. Hagel notes that the three businesses command different, conflicting culture and economics for performance, and that given those different cultures and economics, bundling of them into a single corporation necessarily forces a *compromise* on the performance of each, resulting in loss of competitiveness. Hence he prescribes an unbundling of the corporation into firms specializing in each particular business alone. Such so called pure players will emerge as a winner, with better economics and culture.

In an economy with global networking and frictionless interaction, the name of the game is *flow*, not stock. That is, value is generated as much from *linking*, as from making. Also, value is most likely offered as a bundle. (cf. Schwartz, 1999). The so called *Experience Economy* also tells us that value is not just a product, but the total experience surrounding the product's use. What the firm has to do, therefore, is to design the experience itself, not just the product (Pine and Gilmore, 1998). In fact, in a digital product, experience itself is a product, a

² What underlies such reduction in interaction and transaction costs, of course, is the IT-based global networking discussed above. As IT provides better means for searching, monitoring, and communicating, it significantly reduces the transaction costs, and makes market an economically viable option.

brand.(cf. Dayal et al, 2000).

Positive Feedback and Increasing Returns Economics is another intriguing aspect of the new economy. What it means is that the diminishing returns principle of the old economy is giving way to a new economic principle - an increasing returns economics, where the marginal input-output ratio for a goods increases rather than decreases. A mechanism of positive feedback operates to reinforce that which gains success or to aggravate that which suffers loss. Several factors contribute to this phenomenon, such as the intangible nature of the goods, the lock-in of the customers to those goods, and the network externality effect of the goods (Arthur, 1996). The intangible nature of goods often prescribes a peculiar cost structure where the marginal cost of production becomes near zero, thus making the marginal returns ever increasing (Shapiro and Varian, 1999). Such goods are usually knowledge products with high learning costs, and thus once locked in, it is not easy to switch. The network externality effect follows the so called MetCalfe's law where an addition of a node to a network occurs arithmetically, but the power of the network increases exponentially. Thus a telephone is of no value if no others have it, but its value multiplies with each addition. In other words, the value of goods stems not from scarcity, but from plentitude (Kelly, 1998).

New Economics of Information is also a noteworthy phenomenon to watch (Evans and Wurster, 1997). What the phenomenon describes is that the tradeoff relationship that used to operate between the richness of information and its reach no longer holds.³ Such a trade-off relationship between the richness and reach of information - that when rich information is to be conveyed, reach is constrained, and conversely, when information is delivered to a large audience, its richness is compromised, is caused because information is embedded in and carried by physical things - the carriers, be they humans or artifacts. Information goes only as far as the thing it is embedded in goes and no further. For example, the medium for rich information transfer, most likely a human being, can only be at so many places in so much time. The medium for a wide reach of information, such as broadcast, on the other hand, can only send so much information each time due to constraints on bandwidth, non-particularity of audience, etc. Now information technology (IT) breaks this trade-off relationship by decoupling information from its physical carrier.

Exactly what happens when we decouple information from its physical carrier? For one thing, it frees up our business design. Consider, for example, the insurance business. To provide rich, interactive, customized policy information service to customers, the insurance business used to rely upon human sales agents. However, this severely limits the reach for the agents are time and space bound. So are the encyclopedia business, the automotive business, and so forth, which rely upon personal direct marketing.

Also emerging on the horizon of the new economy are the so-called *economic webs* and *business ecosystems*. An economic web is a cluster of companies that persist on a common resource and architecture to create and deliver value. (cf. Hagel, 1996). One of the most common types of economic webs is a technology web, which forms around a particular technology, say a PC technology. The relationships among firms in the web are complex and fluid, but they were united in their quest to deliver value. For example, in a PC technology web, some companies manufacture microprocessors and semiconductors, others assemble printed circuit boards or CPUs and peripherals, some develop system software or software tools, and others develop specific application software, etc.

The economic webs provide a wide array of economic habitats for firms to inhabit. It is like a vast gold mine with enough reservoir for the hunters. Or more likely, it is a *business*

³ Reach means the number of people, at home or at work, exchanging information. Richness, on the other hand, is defined by the bandwidth or the amount of information that can be moved from sender to receiver in a given time, the degree to which the information can be customized, and the interactivity of information exchange. (cf. Evans and Wurster, 1997).

ecosystem with resources that supports particular communities of species. (cf. Moore, 1993). The species adapt to the habitat and to one another, i.e., they co-evolve (Eisenhardt and Galunic, 2000). In the case of the technology web above, the resource that supports the business community is a new form of computing technology – PC.⁴ If such a habitat runs out of resources, the whole species go extinct, no matter how efficiently an individual member of the species may function. In this sense, they are on board in the same boat, singing *your destiny is mine*.

This *your destiny is mine* phenomenon tells us something about today's competition: competition today is not so much competition among individual firms as competition among economic webs and ecosystems. For instance, of the two dominating economic webs in the early PC industry, the Apple web and the Tandy web, the latter has gone extinct. And so did all the firms in the web. Thus it really doesn't matter how well individual firms perform in the web. What matters more is how the web performs. It is only when the web, the ecosystem, is sound and flourishing, that individual firm performance counts. Hence, an important strategic implication: for a firm to survive, *feed the web first*. Grow the size of the pie. Your share of the pie may come after that. This is exactly what IBM has done in the PC industry, by aggressively opening up and outsourcing its system architecture and software.⁵

Infomediary is another peculiarity to be noted of in the new economy. In an economy reined by global networking, every node in a network is an intermediary. And information technology and the resulting frictionless interaction *disintermediates*, i.e., it removes the unnecessary intermediaries between the maker and the consumer. (cf. Sarker et al, 1996). Disintermediation, however, is only the one side of the coin. The other side of the coin is that of *infomEDIATION*. An important class of intermediaries in the information and knowledge economy, which we call infomediaries, is surging up rapidly (Hagel and Rayport, 1997).

The present day infomediaries are mostly vendor-oriented. They capture information about customers across multiple web sites and help advertisers reach the most appropriate audience. Their value lies in their ability to find the best audiences for vendors. Another kind of vendor-oriented infomediaries are those that aggregate customers according to their profiles, preferences, and other criteria, translate this data into specific product and service needs, and then direct customers to vendors whose offerings meet those needs. Example for the former kind is DoubleClick, and for the latter Auto-by-Tel. More customer-oriented infomediaries, however, will emerge. They will help and represent customers, not vendors. Some will help customers based upon information on their past behaviors to make product or service choices and find the best vendors. Others will represent customers' interests in negotiations with vendors that seek access to them. Still others will screen commercial messages from vendors so that they are relevant to the customers. These customer-oriented infomediaries not so much help vendors sell as help customers buy whatever products or services they need. In fact, they cultivate, awake, uncover the customers' dormant needs. (cf. Hagel and Rayport, 1997)

Finally, there is this *virtual community* building phenomenon. The clusters of like-minded customers form virtual communities. (cf. Hagel and Armstrong, 1997). The members of the communities share common interests and needs, and exchange ideas and experiences on how those interests and needs may be fulfilled. From a business's standpoint, virtual communities are not just a social phenomenon, but an economic phenomenon, representing formation of critical mass of purchasing power. The communities each develop into and form a market segment which cultivates unique tastes and preferences, and accumulates a distinct history of buying patterns. Hence, from a vendor's point of view, they are what the future marketing should be directed at. Mass customization of products and services will be most effective at

⁴ The webs follow the increasing returns economics. That is, the more firms participate in the web, the stronger the web gets.

⁵ Of course, IBM again loses out to the so called Wintel ecosystem. [cf: Moore (Op.Cit)]

this community level, not at an individual person level as it is often talked about. The communities, as discussed above, will be served by infomediaries. The infomediaries will capture detailed profiles of the communities' interests, needs, habits, preferences, and records of past behavior, and represent them to the vendors. The goal, of course, is not to serve vendors, but to serve customers, guiding them on how best to fulfill their needs. If customers and their communities are well served by infomediaries and vendors, *prosumption* will follow. Consumers will also act as producers, by actively engaging in the design of products and services.

The above are a fairly comprehensive description of what are happening in the new economy. While each phenomenon does depict a particular slice of reality for the new economy, the question still lingers upon us: What to make of them all?

What to Make of them all?

A Framework for Understanding-

In order to make sense out of such a diverse set of phenomena for the new economy, we need a framework for understanding - a framework for ordering and structuring the diverse descriptions of the new economy into a coherent whole. Such a framework serves two purposes. On the one hand, it serves an analytic purpose, for breaking down and classifying the various new economy phenomena above. On the other hand, it serves as a synthesizer, integrating the phenomena into a coherent whole.

In the following we adopt *system* perspective as a framework for understanding. We regard the new economy as a system phenomenon and analyze its systemic characteristics and behavior. A system perspective has long been used as a conceptual apparatus for dealing with complex phenomena. First of all, we identify five generic aspects of a system. They are what constitute a system and provide a skeleton for understanding a system. Next, we fill the skeleton by mapping the new economy phenomena discussed in the previous section into corresponding system aspects. Thirdly, we aggregate the various phenomena for the system aspects and draw from them some essential characteristics of the new economy.

5 Generic System Aspects

A system is a set of purposeful entities interacting with one another for the purpose of achieving some common goals. As a collection of interacting entities, it exhibits synergistic, collective behavior. The entities that constitute the system are themselves systems, composed of lower level entities and possessing all the systemic characteristics. As for function, it receives input from the environment and generates output into the environment. In order to get a full understanding of a system, we need to ask at least the following five questions:

- 1) What are the entities in the system? How are they related to one another in the system?
- 2) How do they function?
- 3) What are the goods produced in the system?
- 4) What are the value of the system and its goods?
- 5) What are the collective properties of the system as a whole?

The first question addresses the *structural* aspect of the system: it asks about what business entities constitute the new economy, and how they are related to one another. The second question addresses the *functional* aspect of the system, i.e., how the economy as a whole may function and the individual business entities that comprise the economy may operate. The

third question asks about the goods and services - the *offerings*, produced by the new economy. The fourth question asks about the *value* of the system, i.e., what justifies the continued existence of the system. And the last question asks about the collective characteristics of the system.

A Systemic Understanding of the New Economy

The various new economy phenomena discussed in the previous section describe one or more of the generic system aspects specified above. I have reviewed the phenomena and mapped them the 5 system aspects they each pertain to, as shown in Table 2. For instance, the clustering, e-lance economy, and unbundling phenomena are mapped into the structural aspect of the system, whereas the bundling and experience economy phenomena into the goods and offerings aspect of the system. Some phenomena are necessarily mapped into multiple aspects.

The aggregation of the phenomena mapping allows us to draw some essential characteristics of the system aspects. Such a characterization is not a mere summarization or reiteration but a creative reconstruction and recounting of what's happening in the system. What's strived for is capturing the essence, some critical trends, of what's happening. Characterization is only selective, however. Logical consistency, rather than completeness, is strived for in the characterization.

<Table 2> A Categorization of the New Economy Phenomena

System Aspects		Phenomena	
Structural aspect	Business Entities	-e-Lance economy -Unbundling: Pure Player	-Digital community -Clusters and Blocking
	Relationships Among Entities	-Partnering -Co-evolution Ecosystem	-Digital community -Your destiny is mine: Business
Functional aspect	Transformation	-At the speed of thought -Value Constellation	-Mass customization and prosumption
	Linking	-Global networking -Frictionless interaction and coordination -Disintermediation -Power of connectivity	-At the speed of thought -Markets everywhere -Infomediary
System Goods		-Immediacy: Shortened life cycle -The experience economy -Knowledge everything -New Economics of information -Free Everything: 1 st copy costly, 2 nd copy free -Lock in of customers	-Bundling -Smart everything -Mass customization and prosumption
Value		-Infomediary -The surge of knowledge business	-Value at Linking -Flow economy
Systemic Characteristics		-Sudden impact -Winner takes all -Positive feedback and increasing returns -No harmony, all flux -Red queen effect -Chaos and complexity	-No doors closed: Openness -Ubiquitous computing -Virtuality -Connected smartness -Living systems dynamics

1) Structural Aspect – Business Entities and their Relationships

We observe two distinct, critical trends in the structural aspects of the new economy. The first is the trend of *deconstruction*. As seen in the e-lance and unbundling phenomena, the unit of action in the new economy is being dissembled into finer units. Firms, which used be the only viable unit of action in the economy, no longer maintain its rigid identity. Its boundaries

are being blurred.

The other, rather contradicting trend in the structure of the new economy is that of *aggregation*. As we have seen in clustering, blocking, communities, keiretzues, business webs and ecosystems phenomena, we increasingly observe the unit of action getting bigger, more complex, and more aggregated. Such aggregation occurs both at the supplier and consumer sides. Aggregation on the supplier side takes the form of affiliates network. Aggregation on the consumer side takes the form of demand aggregation as we see in the Accompany case.⁶ We also see aggregation in the intermediary section in the form of navigators and the so called hub sites. (cf. Evans and Wurster, 2000).

What underlies the two seemingly contradicting trends is the drastic reduction in the interaction costs discussed above. The reduced interaction costs alters the economics of grouping activities. And such changed economics cause both deconstruction and aggregation. Deconstruction occurs because the reduced interaction costs allow outsourcing of activities that used to be confined within the boundaries of firms. Aggregation, on the other hand, occurs because the reduced interaction costs allow a more novel, creative grouping of activities.

As the business entities change in form and shape through deconstruction and aggregation, so do the relationships among them. I characterize the changing nature of relationships to be of two types – *networking* and *coopetition*. The networking refers to changes in the structure and volume of relationships. Structure-wise, we see the relationships go from the traditional sequential chain structure to a network structure, where everyone is linked to everyone else. Volume-wise, we see more relationships forming among a greater number of actors. The relationships thus are no longer between a limited set of suppliers and consumers in a single sector or industry. On the contrary, they become more complex and diverse, and span multiple firm boundaries and industries.

The coopetition, on the other hand, refers to changes in the tone and mode of the relationships. Competition used to be the only motive setting the tone and mode of relationships. Cooperation, however, now becomes an equally important motive of relationships, if not more. As the relationships become competitive as well as cooperative, firms begin to realize they co-habit an ecosystem and thus should co-evolve. As such, coopetition indicate a turning to an ecological view of business, a significant paradigm shift in the epistemology of business. (cf. Lewin, 1999).

2) Functional Aspect – Transformation and Linking

How does the new economy system function? We identify the functional characteristics of the new economy in two function domains of the system –transformation and linking. Economic activities result either in transforming input to output or in linking the activities together. Together they create value. And as indicated before, value in the new economy is generated as much in linking as in transforming.

As for *transformation*, we identify two distinct trends. The one is the *virtualization* of the activities. By virtualization I mean the value creating activities are conducted virtually by virtual actors. This is evidenced by the prevalence of outsourcing and the emergent virtual corporations. Of course not every activity is outsourced. Strategic sourcing indicates that a firm's core competence cannot and should not be outsourced (Venkatesan, 1992). Another trend in transformation is that of *complexification*: The value creating mechanisms are becoming increasing complex, moving away from a traditional sequential chain mode to a more complex form of what Mintzberg calls hubs or webs (Mintzberg et al, 1999). The hub

⁶ Accompany is the name of the company which aggregates buyer demands for a better deal with the sellers. (cf. Rappa)

mode is where various value creating activities are coordinated and integrated at a central point. The web, on the other hand, is a network structure with no such central coordinator. Instead every actor on the web interacts with every other actor in creating value. Such complexification of transformation cannot be made possible unless backed up by free flowing and sharing of information and knowledge. This is why knowledge management suddenly becomes so important. (cf. Cohen, 1998).

As for the *linking* aspect of the system function, we also identify two distinct trends. Linking means establishing and facilitating the input-output relationships between the producer and the consumer. An outstanding trend in linking is that of *disintermediation*. The intermediaries that link producers and consumers are removed in the value chain process and the producers and consumers form direct relationships. Another outstanding trend in linking is that of *infomediation*. In the places vacated by traditional intermediaries, we have a new breed of intermediaries, called infomediators, that link people with and through information and knowledge.⁷

The disintermediation and infomediation trends in linking may appear contradictory at a first sight. But it has been explained that the roles the infomediators play are not the same as those of traditional intermediaries (Sarker, et al, 1996). Also such disintermediation and infomediation call for so called cyberization of business, based on the internet. Indeed people have been projecting that off-line businesses will collapse and will be taken over by on-line businesses. The projection has not been realized, however. As we have seen in the cases of GAP and Barnes&Noble, a balanced, mutually reinforcing relationships between off-line and on-line businesses are emphasized as winners today. (cf. Calkins, et al, 2000).

3) System Goods

The goods produced by the new economy system have two important characteristics. First of all, most of the goods the system produces are so called *information goods*. Information and knowledge are increasingly turned into products, and the physical goods are increasingly knowledgized, i.e., the informational content of the products are amplified. The second characteristic of the new economy system goods is the surge of what I term *connectivity goods*. Connectivity goods are those products and services that are based upon the internet and related technological infrastructures and provide linkages between business activities. Such connectivity goods are essential for holding up the complex relationship network structure of the new economy discussed above.

The two characteristics of the new economy system goods correspond to what are happening in transformation and linking functions discussed above. The explosion in information goods indicates that transformation in the new economy is largely informational. The surge in connectivity goods indicates that the relationship structure becomes more complex.

The information and connectivity characteristics of the new economy goods possess several interesting properties. First of all, information goods are content goods: the value of the goods is determined by the quality of information and knowledge that fill the goods. Information goods are also experience goods: you never know its value until you actually experience it. Such experience, however, does not diminish its value. Hence it is durable. Information goods are also time and space independent. They flow freely in time and space, as they are non-physical.

Information goods also have a unique cost structure: while the cost of the first copy is high, the cost of the second copy and on is marginal and near zero. Such cost structure is not

⁷ Evans et al. calls them navigators. (cf. Evans and Wurster, 2000)

subject to production capacity constraint, for it is infinitely reproducible. The only constraint for the goods, therefore, is that of market demand. Information goods are also moldable, stimulating a wide variety of creative bundling and packaging.⁸

The connectivity goods also carry with it some interesting characteristics. First of all, the connectivity goods are systemic: it cannot function properly stand-alone, but should come together, be coordinated, be compatible, and be configured with goods surrounding it. Standards play a critical role in maintaining such coordination and compatibility. Hence, the goods are highly standards-dependent. Also, as it involves considerable learning cost to switch from one systemic goods to another, the goods produce lock-in effect. Finally the goods have network externality and positive feedback effects, following the so called MetCalfe's law.

4) System Value

The value a system generates is what guarantees continued existence and survival of the system. So we ask: what are the value the new economy system generates?: where and how are the value generated? The first question is concerned with the nature of value, and the second with the source of value.

First of all, as for the source of value, the new economy system generates value in two function domains – transformation and linking. The values generated in the two domains may be termed *Value-at-Making* and *Value-at-Linking*, respectively. These values are largely manifested in the information and connectivity goods as discussed above.

As for the nature of value, the values are of two types: *economics value* and *innovation value*. Economics value changes and enhances the economics of doing something. Productivity, performance, speed, efficiency, etc are the terms describing such economics value. Innovation value, on the other hand, engenders and enables creative, novel ways of doing something. Such innovation may come in terms of new business processes, new production methods, new sourcing mechanism, etc., or in terms of new offerings such as novel products and services not imagined before.

The source and nature of the system value, combined, provide 4 generic value types for the new economy. Table <3> illustrates them. Type I Value changes the economics of making something. Type II Value changes the economics of linking activities. Type III Value creates new ways of making something. Type IV Value creates different modes and methods for linking activities. These values types are generic values. What we observe in the real world are combinations of these generic values.

<Table 3> New Economy System Value Types

		Source of Value	
		Transformation	Linking
Nature Of Value	Economics	I	III
	Innovation	II	IV

⁸ Shapiro & Varian provides a detailed discussion of the characteristics of the new economy goods. However, Shapiro et al. treats connectivity not as a system goods but as a system aspect. (cf. Shapiro, Carl, and Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy*, Harvard Business School Press, 1999.)

5) Systemic Characteristics

Can we discern some systemic characteristics of the new economy as a whole? We may do so in terms of the form and behavior of the system. In terms of system form, we note *variability in forms*. In terms of the behavior of the system, we note *unpredictability in behavior*. The business entities and their relationships change their form and structure constantly. Some new entities emerge overnight and some good old ones disappear equally abruptly. And their behaviors are emergent and chaotic. Such changes in form and behavior occur intermittently, in what's called a punctuated equilibrium fashion. Thus small incremental changes accumulate to a certain point to trigger major, structural changes (Tushman and Romanelli, 1985).

The two characteristics of the system - variability in form and unpredictability in behavior, proposes that the new economy is none other than a *complex adaptive system*: a system that is both complex and chaotic, emergent and living, with no harmony but all flux. (cf. Arthur et al, 1997; Kelly, 1998).

6) Summary and Recapitulation

We have identified above 14 or so essential characteristics of the new economy system. The characteristics are drawn from a complex set of the new economy phenomena, mapped into 5 generic aspects of a system: the structural aspect of a system, the functional aspect of the system, the goods produced by the system, their value, and the systemic attributes of the system. For each system aspect, we identified some critical trends. The results are summarized in <Table 4>. As for the structural aspect of the new economy, the business entities go through the two altering processes – *deconstruction* and *aggregation*. Their relationships turn into more *networking* and *coopetition*. As for the functional aspect of the new economy, the critical trends are *virtualization* and *complexification* in the transformation of input to output (value creation activities) and *disintermediation* and *infomediation* in the linking of value activities. As for the goods and value of the system, the trends are the surge of *information goods* and *connectivity goods*, which generate value in enhancing *economics* of activity or in enabling *innovation*. Finally, the system as a whole exhibits the characteristics of *variability* and *unpredictability* in its form and behavior.

<Table 4> Essential Characteristics of the New Economy System

System Aspects		Trends and Characteristics
Structural Aspect	Business Entities	-Deconstruction and Aggregation
	Entity Relationships	-Networking and Coopetition
Functional Aspect	Transformation	-Virtualization and Complexification
	Linking	-Disintermediation and Infomediation
Goods and Offerings		-Information Goods and Connectivity Goods
Value		-Economics Value and Innovation Value in Transformation and Linking
Systemic Attributes		-Variability in Forms and Unpredictability in Behavior

Implications for Business and Firm Strategy

What are the implications of the systemic characterization of the new economy above for business and firm strategy? To begin with, it calls for a change in our worldview, in how we perceive and comprehend the business reality. We are no longer certain about what business entities may constitute the economy and how they will be related to one another. Nor are we certain about how they will function. It is like all of a sudden we are transplanted from a calm, placid backyard to an unruly, chaotic wilderness. To survive there, we need a different worldview, different ontology and epistemology.

I think the most critical implication of the systemic understanding of the new economy for business and firm strategy, however, is what I term the *contextualization* of business. By this I mean the business and firm strategies of the entities, be they individual firms or some larger or smaller variations of it, become increasingly dependent upon the context they are embedded in. There are two reasons for this. First of all, the context of business becomes *live*. It is no longer an inanimate, general, macro level business *environment* that traditional firms have dealt with in the past. On the contrary, the context of business is live, specific, and at a meso level, with specific form, shapes and structures. It actively interacts with and demands response from the entities embedded in it. It is also emergent and constantly forming. Business webs and ecosystems we have discussed above are good examples of such *live* business contexts.

Now as the context of business becomes live, the business and firm strategy should be contextualized as well. That is, business and firm strategy should be tailored to and tuned with the context it is embedded in. Without such contextualization, the firm is not likely to survive. For example, a business strategy conceived in and tailored for a value chain context is not likely to be effective in a community or marketplace business context.

The contextualization of business, however, needs an elaboration in future research. As the context of business becomes live, we now have a hierarchy of the business environment construct, from a highly general macro level environment to a more specific meso level business context. Research on what will constitute the context of business, the hierarchy of and relationships among the contexts, and business and firm strategy tailored to and tuned with the context, is needed in the future.

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